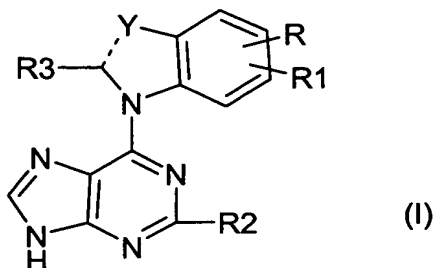


CLAIMS

1) A product of formula (I):



5

in which:

Y represents N, O, S, CHR₃ or =CR₃

the dashed line on the ring indicating that the corresponding bond is single or double,

10 R and R₁, which may be identical or different, represent hydrogen, halogen, hydroxyl, alkyl, alkoxy, cyano, NO₂, NR₄R₅, trifluoromethyl, trifluoromethoxy, aryl, heteroaryl, -S(O)_n-NR₄R₅, acyl, -NH-CO-alkyl or -NH-CO-NH-phenyl in which the alkyl and phenyl radicals
15 are optionally substituted with one or more radicals chosen from thienyl and phenyl, itself optionally substituted, these phenyl radicals themselves being optionally substituted with one or more radicals chosen from halogen atoms and the radicals -NH₂, -NHAlk and
20 -N(Alk)₂,

n represents an integer of 0 to 2,

R₃ represents hydrogen, halogen, alkyl, cyano, NO₂, NR₄R₅, trifluoromethyl, aryl,

R₂ represents a radical R₄, OR₄, SR₄ or NR₄R₅ in which

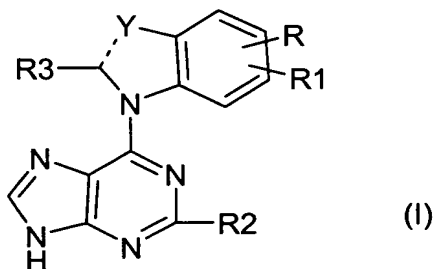
25 R₄ represents a hydrogen atom or an alkyl, cycloalkyl or aryl radical,

NR₄R₅ being such that either R₄ and R₅, which may be identical or different, are chosen from the values for R₄ or R₄ and R₅ form, together with the nitrogen atom
30 to which they are attached, a cyclic radical containing 4 to 6 ring members containing one or more hetero atoms, which may be identical or different, chosen from

N, O and S,
 all the alkyl, alkoxy, cycloalkyl, aryl and
 heterocyclic radicals defined above being optionally
 substituted with one or more radicals chosen from
 5 halogen atoms, hydroxyl, cyano, trifluoromethyl,
 trifluoromethoxy, alkoxy, aryl and heterocyclic
 radicals, radicals with an acid or acid isostere
 function and the radicals -NHR₄, -NalkR₄, -COR₄,
 -COOR₄, CONalkR₄ and -CONHR₄ in which R₄ has the
 10 meaning given above and alk represents an alkyl
 radical,
 all the aryl and heterocyclic radicals defined above
 also being optionally substituted with one or more
 alkyl, hydroxyalkyl and phenylalkyl radicals,
 15 all the aryl radicals defined above also being
 optionally substituted with a dioxol radical,
 all the alkyl and alkoxy radicals defined above being
 linear or branched and containing at most 6 carbon
 atoms,
 20 all the cycloalkyl radicals defined above containing at
 most 6 carbon atoms,
 said products of formula (I) being in all the possible
 racemic, enantiomeric and diastereoisomeric isomer
 forms, and also the pharmaceutically acceptable
 25 addition salts with inorganic and organic acids or with
 inorganic and organic bases of said product of formula
 (I).

2) A product of formula (I):

30



in which:

Y represents N, O, S, CHR3 or =CR3

the dashed line on the ring indicating that the corresponding bond is single or double,

R and R1, which may be identical or different,
 5 represent hydrogen, halogen, hydroxyl, alkyl, alkoxy, cyano, NO₂, NR4R5, trifluoromethyl, trifluoromethoxy, aryl, heteroaryl,
 -S(O)_n-NR4R5,

n represents an integer of 0 to 2,

10 R3 represents hydrogen, halogen, alkyl, cyano, NO₂, NR4R5, trifluoromethyl, aryl,

R2 represents a radical R4, OR4, SR4 or NR4R5 in which R4 represents a hydrogen atom or an alkyl, cycloalkyl or aryl radical,

15 NR4R5 being such that either R4 and R5, which may be identical or different, are chosen from the values for R4 or R4 and R5 form, together with the nitrogen atom to which they are attached, a cyclic radical containing 4 to 6 ring members containing one or more hetero
 20 atoms, which may be identical or different, chosen from N, O and S,

all the alkyl, alkoxy, cycloalkyl, aryl and heterocyclic radicals defined above being optionally substituted with one or more radicals chosen from
 25 halogen atoms, hydroxyl, cyano, trifluoromethyl, trifluoromethoxy, alkoxy, aryl and heterocyclic radicals, radicals with an acid or acid isostere function and the radicals -NHR4, -NalkR4, -COR4, -COOR4, CONalkR4 and -CONHR4 in which R4 has the
 30 meaning given above and alk represents an alkyl radical,

all the aryl and heterocyclic radicals defined above also being optionally substituted with one or more alkyl, hydroxyalkyl and phenylalkyl radicals,

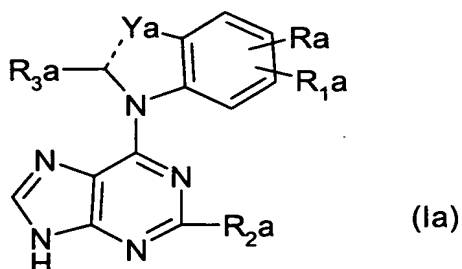
35 all the aryl radicals defined above also being optionally substituted with a dioxol radical,
 all the alkyl and alkoxy radicals defined above being linear or branched and containing at most 6 carbon

atoms,

all the cycloalkyl radicals defined above containing at most 6 carbon atoms,

said products of formula (I) being in all the possible racemic, enantiomeric and diastereoisomeric isomer forms, and also the pharmaceutically acceptable addition salts with inorganic and organic acids or with inorganic and organic bases of said product of formula (I).

3) A product of formula (I) as defined in claim 1, corresponding to formula (Ia) :



in which:

Ya represents N, O, S, CHR3a or =CR3a

the dashed line on the ring indicating that the corresponding bond is single or double,

Ra and R1a, which may be identical or different, represent hydrogen, halogen, hydroxyl, alkyl, alkoxy, cyano, NO₂, NR4aR5a, trifluoromethyl, trifluoromethoxy, phenyl, heteroaryl,

-S(O)_n-NR4aR5a,

n represents an integer of 0 to 2,

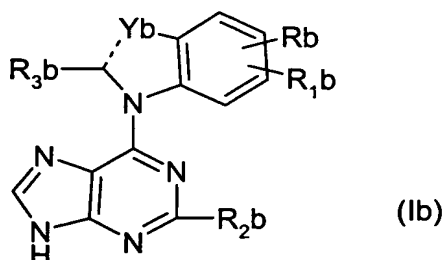
R3a represents hydrogen, halogen, alkyl, cyano, NO₂, amino, alkylamino, dialkylamino, trifluoromethyl and phenyl,

R2a represents a radical R4a, OR4a, SR4a or NR4aR5a in which R4a represents a hydrogen atom or an alkyl, cycloalkyl or phenyl radical,

NR4aR5a being such that either R4a and R5a, which may be identical or different, are chosen from the values for R4a, or R4a and R5a form, together with the nitrogen atom to which they are attached, an optionally

substituted piperidyl, morpholinyl, pyrrolidinyl or piperazinyl radical, all the alkyl, alkoxy, cycloalkyl, phenyl, phenylalkyl and heterocyclic radicals (such as those formed by NR4aR5a) defined above being optionally substituted with one or more radicals chosen from halogen atoms, hydroxyl, cyano, trifluoromethyl, trifluoromethoxy, alkoxy and phenyl radicals, a heterocyclic radical optionally substituted on N or C with a carboxyl radical which is free, salified or esterified with an alkyl radical, the radicals SO₃H, PO(OH)₂, NH-SO₂-CF₃, NH-SO₂-NH-V and NH-SO₂-NH-CO-V in which V represents a phenyl, alkyl or alkenyl radical, the alkenyl radicals being linear or branched containing at most 6 carbon atoms, and the radicals -NalkR4a, -NHR4a, -COR4a, -COOR4a, -CONalkR4a and -CONHR4a in which R4a has the meaning indicated above and alk represents an alkyl radical, all the phenyl and heterocyclic radicals defined above also being optionally substituted with one or more alkyl, hydroxyalkyl or phenylalkyl radicals, all the phenyl radicals defined above also being optionally substituted with a dioxol radical, all the alkyl and alkoxy radicals defined above being linear or branched and containing at most 6 carbon atoms, all the cycloalkyl radicals defined above containing 5 or 6 carbon atoms, said products of formula (Ia) being in all the possible racemic, enantiomeric and diastereoisomeric isomer forms, and also the pharmaceutically acceptable addition salts with inorganic and organic acids or with inorganic and organic bases of said products of formula (Ia).

4) A product of formula (I) as defined in claim 1, corresponding to formula (Ib):



in which:

Yb represents N, CHR_{3b} or =CR_{3b}

the dashed line on the ring indicating that the
5 corresponding bond is single or double,

Rb and R_{1b}, which may be identical or different,
represent hydrogen, halogen, hydroxyl, alkyl, alkoxy,
cyano, NO₂, trifluoromethyl, trifluoromethoxy, phenyl,
-S(O)_n-NR_{4b}R_{5b},

10 n represents an integer of 0 to 2,

R_{3b} represents hydrogen, halogen, alkyl, cyano, NO₂,
amino, alkylamino, dialkylamino, trifluoromethyl and
phenyl,

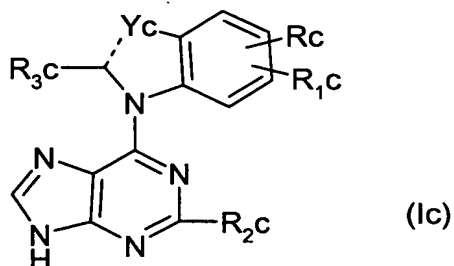
R_{2b} represents a radical R_{4b} or NR_{4b}R_{5b} in which R_{4b}
15 represents a hydrogen atom or an alkyl, cycloalkyl or
phenyl radical,

NR_{4b}R_{5b} being such that either R_{4b} and R_{5b}, which may
be identical or different, are chosen from the values
for R_{4b}, or R_{4b} and R_{5b} form, together with the
20 nitrogen atom to which they are attached, an optionally
substituted piperidyl, morpholinyl or pyrrolidinyl
radical,

all the alkyl, alkoxy, cycloalkyl, phenyl and
phenylalkyl radicals and heterocyclic radicals, such as
25 piperidyl, morpholinyl and pyrrolidinyl, defined above
being optionally substituted with one or two radicals
chosen from halogen atoms, hydroxyl, cyano,
trifluoromethyl, trifluoromethoxy, alkoxy and phenyl
radicals, and tetrahydropyranyl and piperidyl radicals,
30 themselves optionally substituted on N or C with a
carboxyl radical which is free, salified or esterified
with an alkyl radical, and the radicals -NalkR_{4a},
-NHR_{4a} and -COOR_{4a} in which R_{4a} has the meaning

indicated above and alk represents an alkyl radical,
 all the phenyl and heterocyclic radicals defined above
 also being optionally substituted with one or more
 alkyl, hydroxyalkyl and phenylalkyl radicals,
 5 all the alkyl and alkoxy radicals defined above being
 linear or branched and containing at most 4 carbon
 atoms,
 all the cycloalkyl radicals defined above containing 5
 or 6 carbon atoms,
 10 said products of formula (Ib) being in all the possible
 racemic, enantiomeric and diastereoisomeric isomer
 forms, and also the pharmaceutically acceptable
 addition salts with inorganic and organic acids or with
 inorganic and organic bases of said products of formula
 15 (Ib).

5) A product of formula (I) as defined in claim 1,
 corresponding to formula (Ic):



20 in which:

Yc represents N, CH₂ or CH=,

the dashed line on the ring indicating that the
 corresponding bond is single or double,

Rc and R_{1c}, which may be identical or different,
 25 represent hydrogen, halogen, hydroxyl, alkyl, alkoxy,
 phenylalkoxy, phenylalkyl, cyano, NO₂, trifluoromethyl,
 trifluoromethoxy, phenyl, -S(O)_n-NH₂ optionally
 substituted on the nitrogen atom with one or two alkyl
 radicals and n represents an integer of 0 to 2,

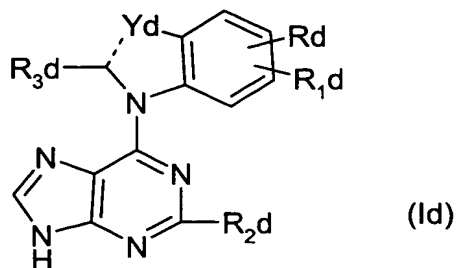
30 R_{3c} represents hydrogen, halogen, alkyl, cyano, NO₂,
 trifluoromethyl and phenyl,

R_{2c} represents a radical NR_{4c}R_{5c} in which either R_{4c}

and R5c, which may be identical or different, are such that R4c represents a hydrogen atom or an alkyl, cycloalkyl, phenyl or phenylalkyl radical, the alkyl, cycloalkyl, phenyl and phenylalkyl radicals being optionally substituted with one or more radicals chosen from hydroxyl, amino or carboxyl which is free, salified or esterified with an alkyl radical, tetrahydropyranyl radical or piperidyl radical, optionally substituted on N or C with a carboxyl radical which is free, salified or esterified with an alkyl radical, and R5c represents a hydrogen atom or an alkyl radical, or R4c and R5c form, together with the nitrogen atom to which they are attached, a piperidyl, morpholinyl or pyrrolidinyl radical, these radicals being optionally substituted with an alkyl, hydroxyalkyl, amino, mono-alkylamino or dialkylamino radical, all the alkyl and alkoxy radicals defined above being linear or branched containing at most 4 carbon atoms, said products of formula (Ic) being in all the possible racemic, enantiomeric and diastereoisomeric isomer forms, and also the pharmaceutically acceptable addition salts with inorganic and organic acids or with inorganic and organic bases of said products of formula (Ic).

25

6) A product of formula (I) as defined in claim 1, corresponding to formula (Id):



30

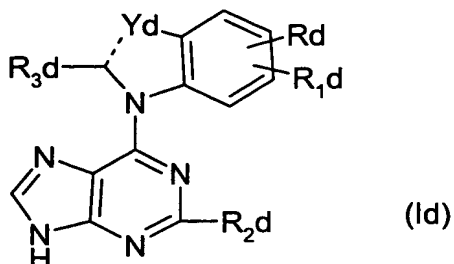
in which:

Yd represents N, CH₂ or CH=,

the dashed line on the ring indicating that the corresponding bond is single or double,
 Rd and R1d, which may be identical or different, represent hydrogen, halogen, alkyl, alkoxy,
 5 phenylalkoxy, NO₂, dialkylaminosulfonyl, -NH₂, trifluoromethyl, -CO-CH₃, -NH-CO-alkyl or -NH-CO-NH-phenyl in which the alkyl radical is optionally substituted with a thienyl or phenyl radical and the phenyl radical is optionally substituted with one or
 10 more radicals chosen from halogen atoms and the radicals -NH₂, -NHAlk and -N(Alk)₂,
 R3d represents hydrogen or alkyl,
 R2d represents a radical NR_{4d}R_{5d} in which either R_{4d} and R_{5d}, which may be identical or different, are such
 15 that R_{4d} represents a hydrogen atom, a linear or branched alkyl radical containing 1 to 4 carbon atoms and optionally substituted with one or two hydroxyl(s), a cycloalkyl radical optionally substituted with an amino or hydroxyl radical or a phenyl or phenylalkyl (1
 20 to 4 C) radical with phenyl optionally substituted with a carboxyl radical which is free, salified or esterified with an alkyl radical, a tetrahydropyranalkyl (ex 28) radical or a piperidylalkyl (ex 31, 36) radical optionally substituted on N or C
 25 with a carboxyl radical,
 and R_{5d} represents a hydrogen atom or an alkyl radical, or R_{4d} and R_{5d} form, together with the nitrogen atom to which they are attached, a piperidyl radical optionally substituted with an amino radical, a morpholinyl
 30 radical or a pyrrolidinyl (ex 34) radical optionally substituted with a hydroxyalkyl radical,
 all the alkyl and alkoxy radicals defined above being linear or branched containing at most 4 carbon atoms,
 said products of formula (Id) being in all the possible
 35 racemic, enantiomeric and diastereoisomeric isomer forms, and also the pharmaceutically acceptable addition salts with inorganic and organic acids or with inorganic and organic bases of said products of formula

(Id).

7) A product of formula (I) as defined in claim 1, corresponding to formula (Id):



in which:

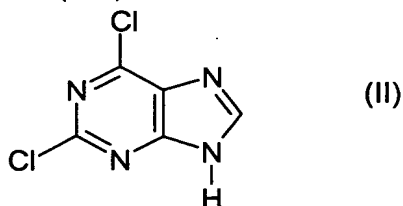
- Yd represents N, CH₂ or CH=,
 the dashed line on the ring indicating that the corresponding bond is single or double,
- 10 Rd and R1d, which may be identical or different, represent hydrogen, halogen, alkyl, alkoxy, phenylalkoxy, NO₂, dialkylaminosulfonyl, R3d represents hydrogen or alkyl,
- R2d represents a radical NR4dR5d in which either R4d and R5d, which may be identical or different, are such that R4d represents a hydrogen atom, a linear or branched alkyl radical containing 1 to 4 carbon atoms and optionally substituted with one or two hydroxyl(s), a cycloalkyl radical optionally substituted with an amino or hydroxyl radical or a phenyl or phenylalkyl (1 to 4 C) radical with phenyl optionally substituted with a carboxyl radical which is free, salified or esterified with an alkyl radical, a tetrahydropyranalkyl (ex 28) radical or a piperidylalkyl (ex 31, 36) radical optionally substituted on N or C with a carboxyl radical,
- 25 and R5d represents a hydrogen atom or an alkyl radical, or R4d and R5d form, together with the nitrogen atom to which they are attached, a piperidyl radical optionally substituted with an amino radical, a morpholinyl radical or a pyrrolidinyl (ex 34) radical optionally substituted with a hydroxyalkyl radical,
- 30

all the alkyl and alkoxy radicals defined above being linear or branched containing at most 4 carbon atoms, said products of formula (Id) being in all the possible racemic, enantiomeric and diastereoisomeric isomer
 5 forms, and also the pharmaceutically acceptable addition salts with inorganic and organic acids or with inorganic and organic bases of said products of formula (Id).

10 **8)** A product of formula (I) as defined in claim 1, having the following names:

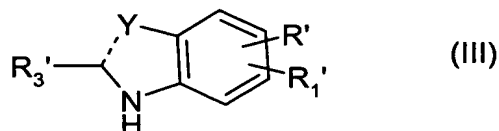
- trans-N-[6-(5,6-dichloro-2,3-dihydro-1H-indol-1-yl)-9H-purin-2-yl]-1,4-cyclohexanediamine dihydrochloride
- trans-N-[6-(1H-benzimidazol-1-yl)-9H-purin-2-yl]-1,4-
- 15 cyclohexanediamine dihydrochloride
- trans-N-[6-(5,6-dimethyl-1H-benzimidazol-1-yl)-9H-purin-2-yl]-1,4-cyclohexanediamine
- trans-N-[6-(5,6-dichloro-1H-benzimidazol-1-yl)-9H-purin-2-yl]-1,4-cyclohexanediamine hydrochloride
- 20 - trans-N-[6-(5-methoxy-1H-benzimidazol-1-yl)-9H-purin-2-yl]-1,4-cyclohexanediamine dihydrochloride
- trans-N-[6-(1H-indol-1-yl)-9H-purin-2-yl]-1,4-cyclohexanediamine dihydrochloride
- trans-N-[6-[6-(phenylmethoxy)-1H-benzimidazol-1-yl]-9H-purin-2-yl]-1,4-cyclohexanediamine
- 25 - trans-N-[6-[5-(phenylmethoxy)-1H-benzimidazol-1-yl]-9H-purin-2-yl]-1,4-cyclohexanediamine
- trans-4-[[6-(1H-benzimidazol-1-yl)-9H-purin-2-yl]-amino]cyclohexanol
- 30 - trans-N-[6-(2,3-dihydro-5-nitro-1H-indol-1-yl)-9H-purin-2-yl]-1,4-cyclohexanediamine dihydrochloride
- trans-N-[6-(2,3-dihydro-6-(trifluoromethyl)-1H-indol-1-yl)-9H-purin-2-yl]-1,4-cyclohexanediamine (ex 40)
- trans-N-[1-[2-[(4-aminocyclohexyl)amino]-9H-purin-6-yl]-2,3-dihydro-1H-indol-5-yl]-2-thiopheneacetamide
- 35 (ex 41)
- trans-N-[6-(6-nitro-2,3-dihydro-1H-indol-1-yl)-9H-purin-2-yl]-1,4-cyclohexanediamine (ex 44).

9) A method for preparing the products of formula (I), as defined in claim 1, characterized in that the compound of formula (II):



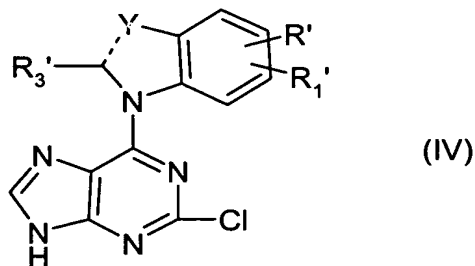
5

is subjected to the action of a compound of formula (III):



10 in which R', R1' and R3' have the meanings indicated respectively in claim 1 for R, R1 and R3, in which the optional reactive functions are optionally protected with protective groups, and Y has the meaning indicated in claim 1,

so as to obtain a product of formula (IV):



15

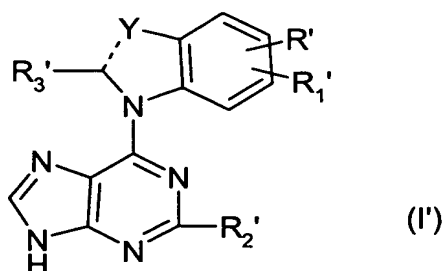
in which R', R1', R3' and Y have the meanings indicated above,

which product of formula (IV) is subjected to a reaction with a compound of formula (V):

20



in which R2' has the meaning indicated in claim 1 for R2 in which the optional reactive functions are optionally protected with protective groups, so as to obtain a product of formula (I'):



in which R', R1', R2', R3' and Y' have the meanings indicated above,

the products of formula (I') having the meaning
 5 indicated in claim 1 for the products of formula (I) in
 which the optional reactive functions are optionally
 protected with protective groups,
 which products of formula (I') can be products of
 formula (I) and which, so as to obtain other product(s)
 10 of formula (I), can be subjected, if desired and if
 necessary, to one or more of the following conversion
 reactions, in any order:

- a) a reaction of esterification of an acid function,
- b) a reaction of saponification of an ester function to
 15 an acid function,
- c) a reaction of oxidation of an alkylthio group to a
 corresponding sulfoxide or sulfone,
- d) a reaction of conversion of a ketone function to an
 oxime function,
- 20 e) a reaction of reduction of the free or esterified
 carboxyl function to an alcohol function,
- f) a reaction of conversion of an alkoxy function to a
 hydroxyl function, or else or a hydroxyl function to an
 alkoxy function,
- 25 g) a reaction of oxidation of an alkyl function to an
 aldehyde, acid or ketone function,
- h) a reaction of conversion of a nitrile radical to a
 tetrazolyl,
- i) a reaction of removal of protective groups which the
 30 protected reactive functions may carry,
- j) a reaction of salification with an inorganic or
 organic acid or with a base so as to obtain the

corresponding salt,

k) a reaction to resolve the racemic forms into resolved products,

said products of formula (I) thus obtained being in all
5 the possible racemic, enantiomeric and diastereoisomeric isomer forms.

10) As a medicinal product, a product of formula (I) as defined in any one of claims 1 to 5, and also the
10 pharmaceutically acceptable addition salts with inorganic and organic acids or with inorganic and organic bases of said products of formula (Id).

11) As a medicinal product, a product of formula (I) as
15 defined in claim 6, and also the pharmaceutically acceptable addition salts with inorganic and organic acids or with inorganic and organic bases.

12) A pharmaceutical composition containing, as active
20 principle, at least one of the medicinal products as defined in claim 8 or 9.

13) The use of the products of formula (I) as defined in any one of claims 1 to 6, and/or of their
25 pharmaceutically acceptable salts, for preparing medicinal products intended for the prevention or treatment of fungal diseases.

14) The use of the products of formula (I) as defined
30 in any one of claims 1 to 6, and/or of their pharmaceutically acceptable salts, for preparing medicinal products intended for the prevention or treatment of fungal diseases such as in particular candidiasis, aspergillosis, histoplasmosis and
35 coccidiosis.

15) The use of the products of formula (I) as defined in any one of claims 1 to 6, and/or of their

pharmaceutically acceptable salts, for preparing medicinal products intended for the prevention or treatment of diseases caused by *Candida albicans*.

- 5 **16)** The use of the products of formula (I) as defined in any one of claims 1 to 6, and/or of their pharmaceutically acceptable salts, for preparing medicinal products intended for the prevention or treatment of systemic candidiasis.
- 10 **17)** A product of formula (I) as defined in claim 1 having antifungal properties, as an inhibitor of *Candida albicans* CIV1 protein kinases.
- 15 **18)** A pharmaceutical composition containing, as active principle, at least one inhibitor of *Candida albicans* CIV1 protein kinases as defined in claim 14.
- 20 **19)** The use of the compositions as defined in claim 16, as antifungal agents.
- 20)** As a novel industrial product, a compound of formula (IV).
- 25 **21)** The pharmaceutical composition as claimed in claim 16, which is used as an antimitotic medicinal product, in particular for cancer chemotherapy or else for the treatment of psoriasis, of parasitic diseases, such as those due to fungi or to protists, or of
- 30 Alzheimer's disease.
- 22)** The pharmaceutical composition as claimed in claim 16, which is used as an antineurodegenerative, in particular anti-neuronal apoptosis, medicinal product.
- 35 **23)** The use of the products of formula (I) as defined in claims 1 to 6 for preparing medicinal products intended for cancer chemotherapy, for the treatment of

psoriasis or of parasitic diseases such as those due to fungi or to protists, for the treatment of Alzheimer's disease or for the treatment of neurodegenerative disorders, in particular neuronal apoptosis.

5

24) The use of the products of formula (I), and/or of their pharmaceutically acceptable salts, as defined in claims 1 to 6, for preparing medicinal products intended for the prevention or treatment of diseases associated with a disturbance of the secretion and/or of the activity of protein tyrosine kinases and of serine/threonine kinases.

25) The use of the products of formula (I), and/or of their pharmaceutically acceptable salts, as defined in claims 1 to 6, for preparing medicinal products intended for the treatment or prevention of immunity, infection, allergy, and autoimmune diseases.

26) The use of the products of formula (I), and/or of their pharmaceutically acceptable salts, as defined in claims 1 to 6, for preparing medicinal products intended for the treatment or prevention of diseases such as proliferative diseases, cancer, restenosis, inflammation, allergies or cardiovascular diseases.